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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/821,857

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

MAIL DATE

DELIVERY MODE

01/09/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/821,857

Applicant(s)

NAGANUMA ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remark

- This Office Action is in response to the amendment filed by the applicant on **November 13, 2007**, which has been entered into the file.
- By this amendment, the applicant has amended claims 1, and 11-13.
- Claims 1-20 remain pending in this application.

Response to Amendment

1. The amendments filed on **June 19, 2007 and November 13, 2007** are objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: *"filter arranged in a path of wavelength division multiplexed collimated beam including a plurality of different wavelengths multiplexed together and which are not separated into separated wavelengths and having a non-uniform intensity distribution"* and the phrase *"intensity of the collimated beam incident on the diffraction unit varies as the diffraction unit is moved"*. The specification fails to give **POSITIVE** and **EXPLICIT** support for such. The figures and the specification **fail** to give positive support for having the filter arranged in a wavelength division multiplexed collimated beam and fail to give positive support for the different wavelengths multiplexed together and which are not separated into respective wavelengths. Figure 2A really cannot be relied upon to support the non-uniformity of the intensity because depending on the beam waist of the beam, there are certain beam waist of the beam has relative uniform intensity. The figures and specification in particular demonstrate no specific and definite structural relationship between the filter and the wavelength divisional multiplexer which makes the claimed phases concerned "wavelength division multiplexed" beam with no specific support.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added matters are set forth in the paragraphs above.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear where does the “wavelength divisional multiplexed collimated beam” , (please see the amended claims 1, and 11-13) come from. Does this imply a wavelength divisional multiplexer is included? Then what is the structural relationship and logical relationship between the variable filter and the wavelength divisional multiplexer? The claims are drawn to a variable filter. The variable filter does not require the multiplexer for generating the light beam to make it a filter. The wavelength divisional multiplexer also is not part of the filter. It is not clear how could the property of a light beam being part of the filter. The wavelength divisional multiplexer does not contribute to the **structure** of the variable filter. The specific property of the light is **also not a structure part of the variable filter..** Rather the wavelength divisional multiplexer and the property of the light is only an INTENDED application of the

variable filter. The variable filter certainly can have filter function to light source have other light property.

The feature concerning the light source and its property is therefore being examined as an intended use of the variable filter.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1-5, 7-9 and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Fukushima (PN. 5,805,759).**

Fukushima teaches an *optical device* that is comprised of an *optical filter* (6, Figures 4, and 7(C)) that is placed in the beam path of a *collimated light beam* (SP). Fukushima teaches that the optical filter comprises a first and a second portions (6D) that in between the two portions there is a *slit* (42) such that the center wavelength of the collimated light beam that passes through the filter is selected and the transmittance of the collimated light beam verses the wavelength characteristics changes as a function of the wavelength, (please see Figure 7(D)). Fukushima further teaches that the filter may be moved by a *driver* (32) in a direction that is *perpendicular* to the direction of the collimated light beam, (please see Figures 6-7, column 6, lines 54-55) such that different center of wavelength of the pass-band of the collimated light can be selected as the filter is moved in the direction perpendicular to the collimated light beam, (please see column 9, lines 29-44).

This reference has met all the limitations of the claims with the exception that it does not identify explicitly that the slit is a diffraction unit. However it is known in the art that a single slit having slit

width that is *much greater* than the wavelength of the incident light beam will form *single slit diffraction unit* and a maximum diffraction peak or transmittance peak for the selected and diffracted light having the selected wavelength will be formed by this single slit diffraction. Since the Fukushima reference teaches that the wavelength interest is in the range of 1.5 microns, and the slits are of the macroscopic size this means it is implicitly true that the slit (42) does form a single slit diffraction unit and the transmittance of the light beam as shown in Figure 7(D) is a maximum diffraction peak. It is also obvious to one skilled in the art, if the slit is not of the size, to make the slit to have the size capable of making single slit diffraction unit for the benefit of making the transmittance filter via the slit of Fukushima utilizing diffraction theory to maximize the transmittance peak for the pass-band of the collimated light beam.

Claims 1, and 11-13 have been amended to include the phrase that “the filter is arranged in the path of a wavelength divisional multiplexed collimated beam including a plurality of different wavelengths multiplexed together and which are not separated into separated wavelengths and having a non-uniform intensity distribution” and the phrase “the intensity of the collimated beam incident on the diffraction unit varies as the diffraction unit is moved”. These features are rejected under 35 USC 112, first paragraph, for lacking explicitly support from the specification and are rejected under 35 USC 112, second paragraph, for lacking structural relationship with the variable filter, for the reasons stated above. In particular, the specification, the figures and claims totally fail to disclose explicitly that how the wavelength divisional multiplexer being part of the variable filter. Furthermore, the recitation is really referred to a manner of intended use of the filter. The applicant being one skilled in the art must understand that the intended application of the filter really does not affect the *structure* of the variable filter. At least the claims completely fail disclose any physical structure of the filter that is determined by the light beam. The feature concerning the “wavelength divisional multiplexed collimated light beam including a plurality of different wavelengths multiplexed together and which are not separated into respective wavelengths and having non-uniform intensity” *is not part* of the filter. It can only be held as

manner of intended use. It has been held that a **recitation** with respect to the **manner** in which a claimed **apparatus** (in this case the variable filter) is intended to be employed (in this case, intended wavelength divisional multiplexer) **does not differentiate** the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987). Furthermore, Fukushima teaches that the light beam input from the optical fiber (16, Figure 4) must be a wavelength divisional multiplexed light beam, the same way as the instant application, since the light beam comprised a plurality of wavelengths multiplexed together and it is collimated by the collimating lens (28) and the filter (6) is placed in the light path of this light beam. The wavelength divisional multiplexed collimated light beam right after the lens (28) is not separated into respective wavelengths.

Also, Fukushima teaches specifically that the collimated light beam generated from the optical fiber is a spectral beam (SP) that includes multiple wavelength components, (please see column 5, lines 10-15). Although it does not teach explicitly that the intensity of the collimated beam is non-uniform, such may be implicitly included since light beam generated from an optical fiber (16, Figure 4) generally does not have a uniform intensity by itself. Since both the instant application and the cited Fukushima reference teach that the collimated light are generated from an optical fiber (101 for the instant application and 16 for Fukushima), then the light beam will have the same intensity uniformity or non-uniformity. Also since Fukushima teaches the same variable filter property, namely for making the transmittance changes with the wavelength, this implies that the light intensity of the collimated beam varies as the diffraction unit or slit is moved, the same way as the instant application.

With regard to claim 2, Fukushima teaches that the first and second filter portions are formed by plates (6D), although this reference does not teach explicitly that the portions are made by film, however since the same function, namely making these portions filter portions, is the same to make them by film or plates would have been obvious variations to one skilled in the art for the benefit of making the filter fits the specific design requirement.

With regard to claims 3-5 and 15-16, Fukushima teaches that a plurality of the optical filters (6, Figure 9) may be used wherein each of the optical filters is individually driven by the driver to move in the direction perpendicular to the direction of the collimated light beam. Fukushima teaches that each of the plurality of optical attenuation filters has specific slit patterns (please see Figures 5-7) and they are driven to provide specific transmittance characteristics, (please see Figures 10). The slits for different filters are implicitly arranged at certain angle with respect to each other since even if they are parallel to each other they are at angle zero with respect to each other.

With regard to claim 7, this reference does not teach explicitly that the driver is the types of driver claimed however these claimed drivers are all well known standard drivers in the art to use one of them would have been obvious modification to one skilled in the art for the benefit of effectively moving the optical filter as desired.

With regard to claim 8, it is implicitly true the different arrangements of the edges and slits for the attenuation optical filters result different wavelength characteristics.

With regard to claim 9, Fukushima teaches that the filter portion essentially has zero transmittance but it does not teach explicitly if they are reflection or not. However such modification does not change the function of the slit, which essentially provides transmitted diffraction beam. Furthermore, it is implicitly true that zero transmission can include non-zero reflection of the incident light and the reflection of the collimated light will be in the direction parallel to the collimation direction, by the principle of reflection.

With regard to claim 14, Fukushima teaches that the light attenuation filter region lines (ETL) with certain pitch as relative to the beam spot size (SP) is set to be less than one quarter of the beam spot size, (please see Figures 5-6). It would then have been obvious to make the grating structure of the attenuation optical filter with edges to have the pitch to be less than a quarter of the beam size for the benefit of enabling the attenuation filter to provide desired wavelength transmittance pattern.

With regard to newly added claims 17-20, Fukushima et al in different embodiment teaches that the first and second filter portion can have equal non-zero transmission with the diffraction portion defined by the edges of the first and second filter portions, (please see Figures 7(A) and 7(B)).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima as applied to claim 1 above, and further in view of the Japanese Patent (JP 10-253327 A) by Matsuno et al.

The variable filter taught by Fukushima as described in claim 1 above has met all the limitations of the claim.

With regard to claim 10, this reference does not teach explicitly that the filter is made by glass material and with film formed on the glass material to form the filter portion. Matsuno et al in the same field of endeavor teaches that an attenuation filter may be formed by thin film pin hole (14) on a glass substrate (13, Figures 2 and 3). It would then have been obvious to apply the teachings of Matsuno et al to modify the variable filter of Fukushima for the benefit of actually making the variable filter.

9. Claims 1-5, 6, 10, 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US patent application publication by Luo et al (US 2004/0005115 A1).

Luo et al teaches a add/drop multiplexer having an etalon filter structure that is comprises a filter having a first filter portion and a second filter portions (380, and 390, Figure 3) with a slit serves as the diffraction unit that is defined by the *edges* of the first and second filter portions and a third and fourth filter portions (340 and 350) with a slit serves as the second diffraction unit formed by the edges of the third and fourth filter portions. The filter provided a transmittance verses wavelength that is changed with respect to the wavelength since the filter portions are designed to *transmit and reflect light* of different wavelength.

This reference does not teach explicitly that the filter is arranged in the optical path of a collimated light but this is really is intended use that does not affect the structure of the filter. Furthermore, Luo et al discloses the Fabry-Perot filter is utilized in an add/drop multiplexer device, wherein collimated light is most often used to allow the best quality of the multiplexer device.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that it include a moving unit for moving the diffraction unit to change the transmittance verses wavelength characteristics. This reference does not teach such explicitly however it is implicitly true that certain moving unit is there to align the filters with the incident light to allow the best operation of the add/drop multiplexer also by moving the filter therefore the diffraction unit, different portions of the filter portions will be intercepted by the incident light which therefore changes the transmittance characteristics. It would therefore have been obvious to one skilled in the art to modify the filter of Luo et al to add moving unit to properly align the incident light beam with the filter portions.

Claims 1, and 11-13 have been amended to include the phrase that “the filter is arranged in the path of a wavelength divisional multiplexed collimated beam including a plurality of different wavelengths multiplexed together and which are not separated into separated wavelengths and having a non-uniform intensity distribution” and the phrase “the intensity of the collimated beam incident on the diffraction unit varies as the diffraction unit is moved”. These features are rejected under 35 USC 112, first paragraph, for lacking explicitly support from the specification and are rejected under 35 USC 112, second paragraph, for lacking structural relationship with the variable filter, for the reasons stated above. In particularly, the specification, the figures and claims totally fail to disclose explicitly that how the wavelength divisional multiplexer being part of the variable filter. Furthermore, the recitation is really referred to a manner of intended use of the filter. The applicant being one skilled in the art must understand that the intended application of the filter really does not affect the *structure* of the variable filter. At least the claims completely fail disclose any physical structure of the filter that is determined by

the light beam. The feature concerning the “wavelength divisional multiplexed collimated light beam including a plurality of different wavelengths multiplexed together and which are not separated into respective wavelengths and having non-uniform intensity” *is not part* of the filter. It can only be held as manner of intended use. It has been held that a **recitation** with respect to the **manner** in which a claimed **apparatus** (in this case the variable filter) is intended to be employed (in this case, intended wavelength divisional multiplexer) **does not differentiate** the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Madham*, 2 USPQ2d 1647 (1987). Furthermore, Luo et al specifically teaches that the filter is utilized with a wavelength divisional multiplexer (WDM) this implies that the incident light must be a wavelength divisional multiplexed light beam. Although it does not teach explicitly that the intensity of the collimated beam is non-uniform, such may be implicitly included since light beam generated from an optical fiber (Figure 3) generally does not have a uniform intensity by itself. Since both the instant application and the cited Luo et al reference teach that the collimated light are generated from an optical fiber (101 for the instant application and paragraph [0013] for Luo), then the light beam will have the same intensity uniformity or non-uniformity. Also since Luo teaches the same variable filter property, namely for making the transmittance changes with the wavelength, this implies that the light intensity of the collimated beam varies as the diffraction unit or slit is moved, the same way as the instant application.

With regard to claims 3-4, Luo et al teaches there are a plurality of filter portions, (please see Figure 3) and the slits of the adjoining filter making a predetermined angle.

With regard to **amended** claim 10, Luo et al teaches that the filter portions are formed on an optical block (310) that is made of optical quality glass, (please see paragraph [0020]).

Response to Arguments

10. Applicant's arguments filed November 13, 2007 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

11. Applicant's arguments are mainly drawn to the newly added features to the amended claims they have been fully addressed in the paragraphs above.

12. In response to applicant's arguments concerning the intended use the filter within the light beam path of a certain light beam, the applicant is respectfully noted that the manner of using the light filter really does not differentiate the optical filter from the prior art. In particular, the filter disclosed in the prior art can also be utilized in the path of "wavelength divisional multiplexed collimated light beam with non-uniform intensity" and to provide filtering function to the light. The filter structure really is not defined by the light it is subjected under. Placing the filter in the path of different light beam will just provided different filtered light beam, but the filter structure itself is still the same.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Application/Control Number:
10/821,857
Art Unit: 2872

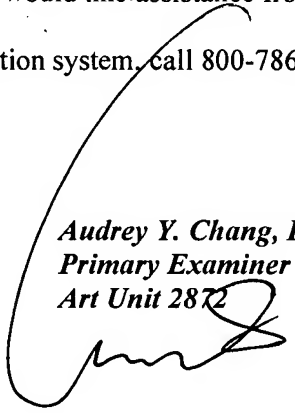
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.